Hawley's Condensed Chemical Dictionary

ELEVENTH EDITION

Revised by

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and
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In fond memory
of
our good friend
Gessner G. Hawley

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"Skellysolves."[409] TM for straight-run aliphatic naphthas having various boiling ranges, specific gravities, evaporation rates, and other properties, which make them suitable for a number of industrial uses.
Hazard: Flammable, dangerous fire risk.

Skraup synthesis. Synthesis of quinoline or its derivatives by heating aniline or an aniline derivative, glycerol and nitrobenzene in the presence of sulfuric acid.

"Skydrol."[83] TM for a series of fire-resistant aircraft hydraulic fluids. 500-A Used for hydraulic systems in turbo jet and turbo prop aircraft, which must operate at −54C. 7000 Used in aircraft cabin superchargers, expansion turbines for air-conditioning systems and the aircraft hydraulic system itself.

slack. (1) Descriptive of a soft paraffin wax resulting from incomplete pressing of the settlings from the petroleum distillate. Though it has some applications in this form, it is actually an intermediate product between the liquid distillate and the scale wax made by expressing more of the oil.
See also scale (2).
(2) Specifically, to react calcium oxide (lime) with water to form calcium hydroxide (slaked or hydrated lime), the reaction is $CaO + HOH \rightarrow Ca(OH)_2$ + heat. The alternate spelling "slake" has the same meaning.

slaframine. (1-acetoxy-8-aminooctahydroindolizine). An alkaloid derived from a fungus that infests clover. It is under research development for use as an agent in retarding cystic fibrosis.

slag. (dross; cinder). (1) Fused agglomerate (usually high in silicates) which separates in metal smelting and floats on the surface of molten metal. Formed by combination of flux with gangue of ore, ash of fuel, and perhaps furnace lining. Slag is often the medium by means of which impurities may be separated from metal.
(2) The residue or ash from coal gasification processes, it may run as high as 40% depending on the rank of coal used.
Use: Railroad ballast, highway construction, cement and concrete aggregate, raw material for Portland cement, mineral wool, and cinder block.

slake. See slack.

slash pine. A loblolly pine growing in swampy areas (slashes) in southeastern US.
Use: Primarily for manufacture of kraft paper pulp.

slate. A fine-grained metamorphic rock which cleaves into thin slabs or sheets. Color usually gray to black, sometimes green, yellow, brown, or red. Slates are composed of micas, chlorite, quartz, hematite, clays, and other minerals.
Occurrence: Pennsylvania, Vermont, Maine, Virginia, California, Colorado, Europe.
Use: Roofing, blackboards; (as powder) filler in paint, rubber, abrasive.

slate black. See mineral black.

slate flour. Finely divided slate used as a filler and dusting agent in rubber, plastics, etc.

slate, green. See slate flour.

slave. A remote-controlled mechanism or instrument that repeats the action of an identical mechanism that is controlled by an operator in another location; it may be activated by electromagnets or by electronic means. Such devices are used chiefly in handling or processing radioactive materials but also have communication uses, as in the Telautograph.

slimicide. A chemical which is toxic to the types of bacteria and fungi characteristic of aqueous slimes. Examples are chlorine and its compounds, organomercurial compounds, phenols, and related substances.
Use: Largely in paper mills and to some extent in textile and leather industries.
See also biocide.

slip clay. A type of clay containing such a high percentage of fluxing impurities and of such a texture that it melts at a relatively low temperature to a greenish or brown glass, thus forming a natural glaze. It must be fine-grained, free from lumps or concretions, show a low air-shrinkage, and mature in burning at as low as 704C.

"Slipicone." TM for fluid silicone compositions to prevent adhesion of materials to one another.
Use: Food-processing and packaging equipment.

as components of useful products, e.g., (1) in steel manufacturing, (2) in roofing and road treatment compositions, and (3) as a base for fertilizers.
See also sewage sludge.

"Sludge Conditioner."[108] TM for a series of polyelectrolytes.
Use: Conditions sludge for dewatering and settling in municipal sewage treatment plants.

slurry. A thin, watery suspension; for example, the feed to a filter press or to a fourdrinier machine; also a stream of pulverized metal ore. A special use of this term refers to a type of explosives called "slurry blasting agents" based on gelatinized aqueous ammonium nitrate, sensitized with various other explosives.

slushing agent. A nondrying oil, grease, or similar material.
Use: Coat metals to afford temporary protection against corrosion.

slush molding. A method of molding certain toys such as doll parts in which a preheated mold is filled with liquid plastic composition and then heated until the required wall thickness has formed. The remaining liquid plastic is then poured out and the mold heated further at 200–220C until the product has completely set. The mold is then cooled and the product removed.

Sm. Symbol for samarium.

smalt.
Properties: Blue powder.
Derivation: A potash-cobalt glass made by fusing pure sand and potash with cobalt oxide, grinding, and powdering.
Use: Paint pigments, ceramic industries (pigment), coloring glass, bluing paper, starch and textiles, coloring rubber.

smectic. A molecular structure (layers or planes) occurring in some liquid crystals; it imparts a soft, soapy property. There are nine types of smectic orientation.

smelting. Heat treatment of an ore to separate the metallic portion with subsequent reduction.
See also roasting.

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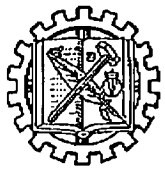

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PREFACE

THE CHEMIST'S DICTIONARY is designed to provide the wid coverage of the terms in which chemists are most commonly intere book includes, therefore, definitions of all the group terms of che stances; the elements, the ions, the radicals, the type-compounds and of chemical substances are defined in light of present-day nomencla book also gives definitions of the laws, reactions, mathematical equ fundamental entities; the presentation extends into physics and oth when necessary to meet the needs of the chemist. Proper names a as well as common names—a policy that has been followed not only to the scientific terms, but for the many applications of chemistry.

A feature that facilitates ready reference is the KEY WORD PLAI ing. Each topic is defined as far as possible in basic terms, and then e important to the explanation that is further defined elsewhere in t printed in bold-face type to serve as a reference to the article on tha

The applications of chemistry include names of industrial processes and laboratory equipment. Coverage of definitions of the chemical t tions, and reagents is provided. Since very many important tests and as well as laws, equations and reactions, are best known by the nam men to whom they are accredited, the large number (more than 5000) name entries are a valuable feature of this book. Both the common- the proper-name terms basic to many phases of pure and applied che brought together for convenient reference.

While the inclusion of the terms of applied chemistry, even though t ber several thousand, has required the most exacting and often arbitra tions, the result will be, it is hoped, sufficiently useful to the vast m chemists to justify the obvious omissions if the book is viewed from t point of a single, highly specialized field. In fact, the primary objecti Dictionary is to furnish to the specialist in any one field the informat fields up to the level of the specialist. To accomplish this purpose t tions have been written, as far as possible, in the most commonly us atomic entities, for example, are discussed either in the language of mechanics or the "classical language" in accordance with the most usage of the particular term. The same pragmatic viewpoint has de the other editorial policies in the preparation of the book; structural are employed only when necessary to clarify the structure of the com the course of the reaction under discussion. The numerical values of th fundamental and derived constants are those deemed the best singl

SLUDGE, ACTIVATED. See activated sludge.

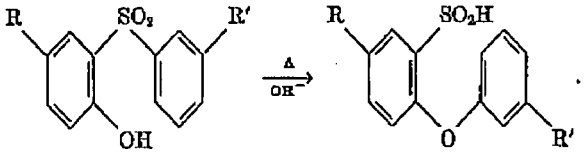
SLURRY. A thin, watery mixture.

Sm Symbol for the element samarium.

SMECTIC PHASE. One of the forms of the mesomorphic state, or the "liquid crystals." In the smectic phase, flow does not occur normally; the substance often forms drops which show a series of fine lines, especially on examination with polarized light. The liquid motion is more of a "gliding" than a flowing action, and x-ray diffraction patterns are obtained in one direction only.

SMELTING. In general, any method of obtaining metals from their ores, which includes fusion; or the fusion operation itself, in which the raw or partly-processed ore is heated in a furnace, with or without added fluxing agents, until the molten metal is separated.

SMILES REARRANGEMENT. A rearrangement of diaryl sulfones, sulfides, ethers, and similar compounds containing, in a position ortho to the groups named above, a hydroxy, amino, or similar group. The rearrangement results in the breaking of the bond between the sulfone, sulfide, etc., group and one of the aryl groups, and the formation of a new bond linking the aryl groups through the hydroxy, amino, or similar, group.



SMITH REAGENT FOR FREE ACIDS. Freshly precipitated silver chloride is dissolved in ammonia and a little of the silver chloride is left undissolved to be certain that the ammonia is fully saturated with silver chloride. This reagent forms precipitates with solutions containing free acids, even very weak acids.

SMITH TEST FOR FORMIC ACID. Add ferric chloride to the neutral solution to be tested. If a red color is produced, add 5 ml. of alcohol per ml. of solution. A precipitate forms if formic acid is present.

SMITH TEST REACTION FOR ALKALOIDS. A few mg. of the alkaloid added to molten antimony trichloride produce the following reactions: brucine, dark red; veratrine, brick-red; aconitine, bronze; narcotine, dark green; narceine, yellow; morphine and codeine, green; thebaine, red.

SMITH TEST REACTIONS FOR CARBAZIDES. A red color develops which is fairly stable for several days, when carbazide or semicarbazide hydrochlorides and diacetylglyoxime are heated with hydrochloric acid. Heating with diacetyl produces a similar color. A bluish-violet color is produced by adding ammonia.

SMITH TEST REACTION FOR FLUORIDE. Fluorides change ferric thiocyanate solution from deep red to orange or yellow. The color is inversely proportional to the quantity of fluoride present and can be used for quantitative estimation of fluoride, provided interfering substances are not present.

SMOKE. In general, a system of solid particles dispersed in a gaseous medium. The gases resulting from combustion constitute a special case.

SMOLUCHOWSKI EQUATION. See equation, Schmoluchowski.

Sn Symbol for the element tin.

SOAP. A compound of one of the higher fatty acids or a mixture of such compounds. The true soaps are salts of the alkali metals

and are soluble in water but the term has been extended to include the salts of other metals, some of which are insoluble in water; combinations of fatty acids and certain organic bases, such as ethanolamine; mixtures of the foregoing substances with alkaline silicates, glycerol, and other additives. See also detergent.

SOAP, METALLIC. A compound formed by the reaction of a metal or metal oxide with an organic acid; in other words, a salt of a heavy metal and an organic acid. Metallic soaps are used as driers in the paint industry, and for other industrial purposes.

SOBOLEWA-ZALESKI TEST. A test for aldehydes made by acidifying the solution to be tested with 2–4% hydrochloric acid and adding a filtered aqueous solution of 1–2 g. pyrrol per liter. A turbidity is produced by small quantities of aldehydes, and a red color by larger quantities.

SODA NITRIC PROCESS. An old process (still operated in scattered small or local installations) for the production of oxides of nitrogen, or nitric acid itself, by treatment of sodium nitrate with sulfuric acid.

SODAIC, SODIC, SODIO-. Containing or pertaining to the metal sodium.

SODERBERG CELL. A cell for the production of aluminum by electrolysis of alumina dissolved in a bath of molten salts. This cell uses a large electrode, cylindrical in form, which originates as a carbonaceous mixture in a hopper above the cell, and becomes hard and conductive by heating as it moves down into the cell.

SODIUM. Metallic element. Symbol Na (natrium). Atomic number 11. Atomic weight 22.997. Density 0.97. Specific heat 0.253. Melting point 97.5° C. Boiling point 880° C. Valence 1. Oxides Na_2O, Na_2O_2. Sodium occurs in sea water, rock salt, cryolite, borax, etc.

SODYL. The radical—NaO.

SOFTENER. This term is widely used in chemical technology in its common meaning to denote a material or agent added to a product or proce the pliability or plasticity of a A special usage is in the treatm in which the term "water applied to a substance usc undesirable salts.

SOFTENING TEMPERATU or less definite physical const stance that does not have a def point, defined as the temperat viscous flow changes to plastic

SOGASOID. A dispersed syst in a gas (see smoke).

SOL. A colloidal solution in system is apparently liquid. If continuous phase the system hydrosol. The term sol is also the dispersion medium of a co tion.

SOLATION. In colloidal no the process of change from a g The gel is said to solate.

SOLDAINI SOLUTION. A 41.6 g. potassium bicarbonate water, in which 1.5 g. cupric ca then dissolved; it is used as a t for glucose, which reduces it.

SOLDER. An alloy which is fused form to join two metallic

SOLID. A state of aggregation the substance possesses both volume and definite shape. Sol elasticity both of shape and bulk resist any force that tends to volume or form. Solids are cha by very stable surfaces of distin on all sides.

SOLID STRUCTURE. See solid.

SOLIDIFY. To become solid. T from the gaseous or liquid to the s

SOLIDUS CURVE. A curve rep the equilibrium between the so and the liquid phase in a condensed sy